

REMARKS

Claims 1-39 are pending, with claims 1, 4, 7, 10, 13, 16, 19 and 23 being independent. Claims 1, 2, 4, 7, 10, 16, 19 and 23 have been amended, claims 13-15 have been withdrawn from consideration, and claims 27-39 have been added.

Initially, applicant wishes to thank the Examiner and his Primary Examiner for the interview granted on November 17, 2004. As discussed at the interview, and for the reasons presented below, all of the claims, as amended, are believed to be allowable over the prior art of record.

Claims 1-6, 10-12 and 16-18 have been rejected as being unpatentable over Funai in view of Hoga.

With respect to claim 1 and its dependent claims, applicant requests reconsideration and withdrawal of the rejection because neither Funai, Hoga, nor any combination of the two describes or suggests the sequence of steps recited in claim 1. As discussed at the interview, claim 1, as amended, includes a sequence of steps that must be performed in order. In particular, claim 1 recites, among other steps, first cleaning a surface of the semiconductor film by using a first solution, applying a laser beam to the cleaned surface of the semiconductor film to increase crystallinity of the semiconductor film, second cleaning a surface of the semiconductor film by using a second solution after applying the laser beam, patterning the semiconductor film after the second cleaning, and forming a gate insulating film on a surface of the patterned semiconductor film.

One advantage offered by performing the second cleaning step before patterning the semiconductor film and forming the gate insulating film is to reduce variations in the threshold gate-source voltages of resulting thin film transistors. If impurities, such as sodium, remain between a semiconductor film and a gate insulating film, the threshold gate-source voltages of the TFTs tend to vary easily, which can result in image unevenness when the TFTs are used in a display device, for example.

Funai does not describe or suggest the sequence of steps recited in claim 1. For example, in the discussion of Figs. 19A-19D, which the Examiner has identified as describing the claimed subject matter, Funai describes two instances in which a laser is applied. In a first instance, which is discussed in the application at col. 45, lines 39-47, the laser is applied after a silicon oxide film and a nickel thin film are removed and, as discussed at col. 45, lines 48-55, application of the laser is followed immediately by patterning of the crystalline semiconductor film. Thus, in this case, application of the laser cannot correspond to the application recited in the claim because there is not a second cleaning step between when the laser is applied and when the film is patterned, as recited in claim 1.

In a second instance, which is discussed in the application at col. 46, lines 39-49, a laser is applied to perform annealing. However, this application of the laser cannot correspond to that of claim 1 because it occurs after the patterning has occurred. As such, Funai does not describe or suggest at least the sequence of applying, second cleaning, and patterning steps recited in claim 1. Hoga, which was cited for the purpose of showing processing in a nitrogen environment, does not remedy this failure of Funai. Accordingly, applicant requests reconsideration and withdrawal of the rejection of claim 1 and its dependent claims.

With respect to independent claim 4 and its dependent claims, neither Funai, Hoga, nor any combination of the two describes or suggests applying a laser beam to a semiconductor film through an oxide film, and patterning the semiconductor film after applying the laser. As noted above, the application of a laser beam discussed by Funai at col. 45, lines 39-47, is to the surface of a semiconductor film after an oxide film has been removed, and the application discussed by Funai at col. 46, lines 39-49, occurs after patterning has been performed. Hoga, which was cited for the purpose of showing processing in a nitrogen environment, does not remedy this failure of Funai. Accordingly, applicant requests reconsideration and withdrawal of the rejection of claim 4 and its dependent claims.

Like claim 4, independent claims 10 and 16 recite applying a laser beam to a semiconductor film through an oxide film, and patterning the semiconductor film after applying the laser. Accordingly, applicant requests reconsideration and withdrawal of the rejection of

claims 10 and 16, and their dependent claims, for at least the reasons discussed above with respect to claim 4.

Claims 7-9 have been rejected as being unpatentable over Funai in view of Yoneda and Hoga. Like claim 4, independent claim 7 recites applying a laser beam to a semiconductor film through an oxide film, and patterning the semiconductor film after applying the laser beam. As discussed above, neither Funai, Hoga, nor any combination of the two describes or suggests such a procedure. Moreover, Yoneda, which was cited for the purpose of showing processing in an atmosphere containing oxygen and nitrogen, does not remedy this failure of Funai and Hoga. Accordingly, applicant requests reconsideration and withdrawal of the rejection of claims 7-9 for at least these reasons.

Claims 19-26 have been rejected as being unpatentable over Funai in view of Asai. Similarly to claim 1, each of independent claims 19 and 23 recites applying a laser beam to a semiconductor film to increase crystallinity of the semiconductor film, second cleaning a surface of the semiconductor film by using a second solution after applying the laser beam, and patterning the semiconductor film after the second cleaning. As discussed above, Funai does not describe or suggest such a procedure. Moreover, Asai, which was cited for the purpose of showing application of the laser beam in air, does not remedy this failure of Funai. Accordingly, applicant requests reconsideration and withdrawal of the rejection of claims 19-26 for at least these reasons.

Applicant submits that all claims are in condition for allowance.

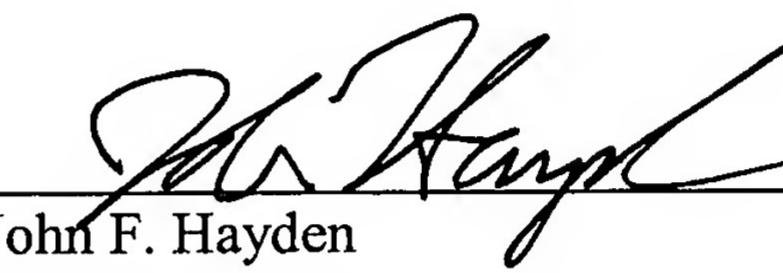
Applicant : Kusumoto, et al.
Serial No. : 10/025,322
Filed : December 18, 2001
Page : 12 of 12

Attorney's Docket No.: 07977-
076003 / US3130/3134D1D1

Enclosed is a \$1,024 check (\$234 for excess claim fees and \$790 for request for continued examination fee). Please apply any other charges or credits to deposit account 06-1050.

Respectfully submitted,

Date: 11/23/04


John F. Hayden
Reg. No. 37,640

Fish & Richardson P.C.
1425 K Street, N.W.
11th Floor
Washington, DC 20005-3500
Telephone: (202) 783-5070
Facsimile: (202) 783-2331